

LAC
4/27/04

METHOD FOR ASSAYING CLUSTERED DNA DAMAGES

This application claims benefit of US provisional Application 60/198,681, filed April 20, 2000.

1 The present invention was made with Government support under contract number DE-AC02-98CH10886, awarded by the 5 U.S. Department of Energy. The Government has certain rights in the invention.

Background of the Invention

Ionizing radiation may produce cancer, death and loss 10 of neural function in humans and animals, and induce killing, mutation and chromosomal aberrations in cells [Bissell et al., (1997) *Modeling Human Risk: Cell and Molecular Biology in Context*, Lawrence Berkeley National Laboratory, Univ. of California, Berkeley]. Humans are 15 exposed to low doses of radiation during air travel, from radon in homes, during space travel or in areas of low-level contamination, including former nuclear weapon production sites. Nuclear energy production facility workers may encounter higher doses of ionizing radiation 20 than others. In addition, humans encounter higher radiation doses during radiotherapy and humans, animals and plants encounter much higher radiation doses in contaminated areas such as Chernobyl and near the sites of other nuclear mishaps [Bissell, 1997; Yang et al., 25 *Radiation Res.* 148 (Sup. 5): S17 (1997); Tucker et al., *Radiation Res.* 148: 216 (1997); Bigbee et al., *Radiation Res.* 147: 215 (1997); Fry et al., *Radiation Res.* 150: 695 (1998)].

Ionizing radiation induces many different types of DNA 30 damages [Wallace, *Radiation Res.* 150 (Sup. 5): S60 (1998)] and the identity of the specific lesion types that are responsible for the biological effects of radiation remains